ART. XIII. *New Views of the Process of Defecation, and their Application to the Pathology and Treatment of the Diseases of the Stomach, Bowels, and other Organs, together with an Analytical Correction of Sir Charles Bell's Views respecting the Nerves of the Face.* By JAMES O'BEIRNE, M. D., Surgeon Extraordinary to the King; one of the Surgeons of the Richmond Surgical Hospital, Dublin, &c. &c. Dublin, 1833. pp. 286. 8vo.

This work is composed of two parts, apparently disconnected, but the author's theoretical opinions involve certain questions with regard to the distribution of the nervous filaments of sensation and motion in the lower part of the intestinal canal, which bring him, by a tolerably natural transition, to the consideration of subjects connected with the physiological relations of the several great divisions of the nervous system.

From the tenor of the preface, it appears that the attention of Dr. O'Beirne was first drawn toward the consideration of the physiological laws of defecation, by the results of his favourite practice in tetanus. The constipation in that disease having yielded to the operation of tobacco enemata—an effect attributed by him to the relaxation of the muscular fibres of the upper portion of the rectum, the contraction of which he believed to occasion the retention of the feces—he was led by a very common process of thought to attribute constipation in general to the same cause. The peculiar neuralogical views of the author will be touched upon but lightly, if at all, in the present article, for the facts and observations upon which they are built, are not detailed in the present treatise, but are promised in a work on tetanus, announced as about to appear in the course of a few months.

It would be difficult to pursue precisely the arrangement of Dr. O'Beirne's arguments and statements in favour of his opinions on the subject of defecation, which are the principal burden of the work. The following general sketch will, however, convey to the reader an idea of those views which he regards as "likely to lead to no mean improvement and alterations, both in the theory and practice of medicine."

According to our author, the sigmoid flexure of the colon is the final receptacle of the feces while accumulating in quantity sufficient to furnish a proper stool. In health, the pouch of the rectum is always empty of feces except immediately before an evacuation, and the upper part of the intestine, intervening between the colon and the pouch, is not only empty, but firmly contracted by its circular muscular fibres. From some of the remarks contained in the early part of the work, the casual reader might infer that Dr. O'Beirne considered the sigmoid flexure of the colon as a cavity closed by a distinct sphincter, but the reverse position is maintained in the sequel. According to the theory, it is the whole upper portion of the rectum that acts as a sphincter. But the arrest of the feces is not exclusively dependant upon the contraction of the rectum; for it is much aided by sions considerably, they are finally opposed by forces acting from without. Our author himself, though he believes this cavity to be habitually "perfectly empty," speaks also of its being habitually and "perfectly *open*"—the syringe pipe, when introduced, moving "*freely* in all directions" within it. No doubt the meaning of the writer, in using the words marked in italics, was to convey the idea that the pouch, when empty, was in a state of simple collapse, and that the finger readily distended it—moving in all directions with very slight opposition. This may appear like verbal hypercriticism, but the example is quoted to show how difficult it is to avoid the occasional use of words sufficiently accurate perhaps to convey correct ideas to those who are well acquainted with the subject, but covering in their literal sense a meaning altogether at variance with the laws of nature. The pouch of the rectum cannot possibly be perfectly open and at the same time perfectly empty. The pressure of the atmosphere renders such a condition impossible. It is not pretended that the cavity is occupied by intestinal gas, and by the hypothesis it contains no feces. Is it then filled with atmospheric air? This cannot be, for by the hypothesis it expels, at each evacuation, *all its contents*, and it is well known that no atmospheric air rushes in at the anus on the cessation of the nisus.

The claim of originality in representing the rectum as habitually empty, appears to be founded chiefly on the fact that physiologists generally describe the colon and rectum as one *continuous* canal, and on the equally general habit of regarding the pouch of the rectum as a final reservoir for the *gradual* accumulation of feces. After an attentive examination of the work under notice, this appears precisely the purpose for which the pouch of the rectum was by nature designed, nor can we perceive any contradiction between the above opinions and the views of Dr. O'Beirne, although he combats them so strongly. The words "continuous" and "gradual," probably convey very different ideas to different persons. The two portions of canal are continuous in a broad sense because they are both portions of the alimentary tube; they are continuous in a narrower sense, because their junction is not provided with a sphincter, but it does not follow that the passage of the feces from the one portion to the other is either constant or easy, *nor was it ever believed to be so*, for the position of the sigmoid flexure, and the comparative fixedness of its extremities—points that are universally understood—are sufficient to suggest to the most casual observer the fact that the feces are retarded in passing the flexure; and, whatever may be thought of the mode in which the intestinal contents are urged through the colon, the *cæcum* has been regarded as a reservoir from time immemorial. No physiologist ever dreamed that the feces therein formed, are perpetually and at all times in motion towards the rectum. The supply of feces to the pouch is therefore necessarily intermittent, and, consequently, the rectum must be generally empty during considerable intervals after the evacuations. These facts may not all have been distinctly and connectedly laid down in books, but this circumstance may be more plausibly attributed to their perfectly obvious character, than to any ignorance of them on the part of the profession.

Again, the precise arrangement of the muscular fibres of the rectum, excepting only the duplicature of the longitudinal fibres at the margin of the internal sphincter, discovered by Dr. Horner, have been described in detail by all the most distinguished writers on anatomy, and the relative strength of the muscular coats of the colon and rectum, has long been familiarly known. Now, if we combine these well known facts,—videlicet, the strength of the muscular coat of the rectum, the frequently empty condition of this intestine, the curvature and connexions of the sigmoid flexure, and the laws of muscular contractility, the consequence is plain. The feces must accumulate in the sigmoid flexure, and if, in consequence of disease, unusual opposition is offered to their passage, they accumulate in the descending colon or the whole colon, the rectum, *it may be*, remaining empty in the mean time. But these views are not novel. It is customary to speak of emptying the *rectum* by injections, but the employment of a pipe three or four inches in length, inserted as far as possible, in order to throw up a quart of fluid, is a very usual practice. The administration of very large injections to dilate spasmodic stricture, or to wash away impacted feces in the colon, is mentioned incidentally by the author himself, as an old practice.

It may be urged by the author, that these attempts at acting upon the colon by injection, were not founded upon the idea that the constipation resulted from the normal or abnormal contraction of the upper part of the rectum. They were often made to conquer the effects of supposed spasmodic or other strictures, either there or higher in the canal. Now, he declares, himself, that the superior extremity of the rectum is, *and has long been considered*, the chief location of the stricture; and to the presence of spasmodic stricture, he attributes those cases of constipation which have been so astonishingly relieved by the method of treatment instituted by him. It must be acknowledged, then, that however different the measures employed may have been, his predecessors at least attempted to conquer the same difficulties upon very analogous principles.

But, has it ever been customary to attempt the relief of costiveness resulting from the action of the superior portion of the rectum, when unaffected by stricture? The same elongated syringe pipe, and the same large injections thrown up forcibly, to dilate the rectum, and enable the fluid to reach the colon, have been frequently practised in fevers and dysentery, long before the doctrine of Dr. O'Beirne was advanced, and we never heard the well known resistance to the flow of large injections attributed to any other cause than the contraction of the rectum, unless feces were distinctly felt in the bowel, which only happens occasionally.

In order to establish his position, that the pouch of the rectum is almost *always* empty, except immediately before a stool, and that any collection of feces there brings on an almost immediate evacuation in healthy patients, Dr. O'Beirne alludes to the very constant absence of traces of feces on the injecting pipe, after the exhibition of enemata, and the want of opposition to the finger from alvine accumulations in examinations per anum. We cannot avoid the impression that more careful and extensive observations on these points would have led the author to different conclusions. Waving the ample evidence of an opposite character that might be adduced, it may be remarked that the introduction of the finger, the pipe, or the stomach tube into the healthy rectum, is extremely apt to determine a stool; and thus the surgeon accomplishes the verification of his own prognosis!

We have known considerable accumulations of feces to remain in the pouch without a discharge for forty-eight hours or more! and even to resist for several hours the action of cathartic medicines. These patients have been persons in good general health, and suffering no material inconvenience from the distension, of which many of them have been altogether unconscious.

Dr. O'Beirne is equally incorrect in supposing that the very hard accumulations in the rectum, so frequently met with in old persons, are confined to them exclusively, or that fluids invariably pass in these instances, so as to produce a seeming diarrhœa. Like all the hollow viscera, the rectum may be subjected to a temporary paralysis from undue distension, while the power of the sphincters is undiminished, and then no discharge whatever takes place. We have witnessed several remarkable cases of this kind, the last of which occurred quite recently, and may be noticed as in point. A young lady, aged about twenty-four years, in good general health, and leading a rather active life, laboured under symptoms leading her friends to suspect the existence of calculus, and they were certainly very similar to those of a fit of stone, but she had never complained of uneasiness about the bladder at any former period. On preparing to sound, while searching for the meatus with the finger, the orifice of the vagina was felt to be closed, as if by a tumour in rear of the canal. With much pain to the patient and some difficulty, the finger was carried fairly into the vagina, and the cause of all the symptoms at once discovered. The rectum was distended to a very great degree and could be distinctly traced as a cylindrical tumour throughout its entire length. It felt almost as hard as stone! When called, we were informed that she had been without a discharge for seven days, but having been subject to costiveness, and feeling no desire to go to stool other than a general bearing down which she referred to the bladder, she had no conception of the true condition of things. All proposals for relieving the rectum by means of the scoop were peremptorily rejected. The patient strongly protested against injections, and it would have been unwarrantable to trust the pipe in the hands of nurses or attendants in a case in which the solidity of the feces was such as to deny an entrance to the finger. She was, therefore, directed repeated suppositories of brown soap, to be followed by forcible self-injections of tepid water from a two ounce syringe with a short beak, and the internal use of an ounce of sweet oil every six or eight hours. Small portions of feces were gradually brought away by the injections, and the rectum became somewhat less tense, but it was not until nearly forty-eight hours had elapsed, and after the exhibition of a tea-spoonful of spirit of turpentine that the rectum recovered its tone. Several enormous stools followed in rapid succession, and the symptoms disappeared. She has perfectly recovered, both from the cystic symptoms and the habitual costiveness, the latter having yielded promptly to a properly regulated diet, and a few small doses of calomel.

The next point to be taken up in order, is the mode in which the feces in the great intestine are propelled throughout the colon from the cæcum to the sigmoid flexure. Dr. O'Beirne seems to attribute this motion almost exclusively to the pressure of the abdominal muscles, and to a general contraction of the whole intestine, usually timed so as to correspond with the moment of alvine evacuation. At each stool the sigmoid flexure is emptied into the rectum, and the cæcum into the sigmoid flexure, the intervening space being occupied with gas. The author seems to reject almost entirely, in regard to the colon, what we know has been before disputed in all the intestines, namely, *the peristaltic motion;* but he distinctly admits the existence of this action in the small intestines in one passage of his work, while in another he calls the mode of accounting for stercoraceous vomiting, by supposing that motion to be inverted, "*gratuitous.*"

This mode of explaining the transmission of feces appears to us altogether too mechanical for general application, for, though it would be unreasonable to doubt the frequent interchange of matter between the cæcum and flexure, at the time, and somewhat in the manner described, yet the explanation will not account satisfactorily for the occasional absence of feces either in the cæcum or the sigmoid flexure, and their occasional presence in isolated masses throughout the transverse and descending colon. There are two circumstances which convince us that feces are actually propelled throughout the whole rout of the intestinal canal by the successive contraction of the circular fibres. These are as follows:—there is no considerable part of the canal, except the caput cæci, the pouch of the rectum, and the duodenum, that is not frequently seen empty after death, and in a state of circular contraction, apparently closing the canal without any collapse. These contractions have been sometimes only a few lines, and sometimes many feet in length. The colon, though more rarely found in this condition, because either feces or flatus are almost universally present in it, is by no means exempt from it, and although the contraction is most frequent in the descending portion, it is met with likewise in the ascending portion, and in the great arch of the bowel. The sudden and narrow contractions are generally rigid to a certain degree, and in the few instances in which the previous history of the case is known, there have been spasmodic symptoms during life. The more general diminutions of calibre, on the contrary, have occurred sometimes in cases of sudden death, from apoplexy, the crush beneath a bank of falling earth, blows on the head, &c.; they are not marked by any rigidity, and we perceive no reason for considering them as morbid phenomena. Again, in persons who have been subjected to long continued abstinence, and whose bowels are almost perfectly empty, it is well known that a small portion of flatus may traverse not only the small intestines, but the cæcum, colon, sigmoid flexure, and rectum, in the course of a few moments; its advance being recognised with ease during no inconsiderable portion of the time. What then becomes of the doctrine of the general contraction of the colon, and the necessity for the distension of the flexure, in order that the process of defecation may be complete?

Dr. O'Beirne certainly generalizes rather too much, and the remark might receive additional illustration from an analysis of his reasons for supposing the upper extremity of the rectum to be invariably the seat of stricture of the rectum, and also his peculiar views of the pathology of dysentery—but this article is becoming somewhat extensive, and it is time to notice the peculiar practice which he has instituted in consequence of his anatomical and physiological observations.

The pathological passage already extracted from the work will explain in some degree the extent to which costiveness, as a symptom, becomes a matter of serious import in the history of many diseases, and it will also explain the motives of the author in recommending the introduction of the stomach-tube beyond the rectum and into the sigmoid flexure of the colon, for the purpose of either dilating the passage, abstracting accumulated feces, or giving exit to flatus, and thus bringing on the "general contraction," which, in all hollow muscles, commences immediately on the removal of a considerable portion of their contents.

That the practice has been attended with happy results in a number of curious cases, is amply proved by those detailed in the work before us, and it has been advocated strongly in fevers and hernia by Dr. Parrish, of this city, who, in his recent work on Hernia and the Diseases of the Urinary Organs, gives due credit to Dr. O'Beirne for this contribution to our therapeutics in this latter disease.

But in defending his claim to originality in the use of the stomach-tube for injections, his tone is not precisely such as will be generally approved, as may be seen from the following extract, in which he adverts to the paper of Dr. Duguid on a case of intestinal obstruction successfully treated by mechanical means.

> "But I am confident that when he comes to know that I employed this mode of treatment successfully for so many years before he thought of it—that it was in very general use in this country at the time he tried it—that the views which induced him to try it are perfectly erroneous,—and that the success of the trial which he made is owing solely to the chance by which false theory is known to lead to sound and successful practice; in short, when he comes to read this work, even Dr. Duguid must be convinced, that any claim which priority of publication might otherwise give him to the introduction of the practice, should yield to that which I have established by such numerous and incontrovertible truths."—p. 225.

Let the question of priority of publication be decided as it may, the use of the stomach-tube for the purpose of reaching points even higher in the canal than the sigmoid flexure, has been familiar to American surgeons from a time long prior to the date of Dr. O'Beirne's first case, though it may not have been employed with exactly the same views which he has advocated, for it is by no means established that spasmodic or organic stricture always originates at the upper extremity of the rectum, or that dilatation of the whole extent of the upper two-thirds of that intestine is a patholigical necessity in the very cases narrated by the author. Moreover, it can hardly be credited that the very slight distension resulting from the passage of a stomach-tube can conquer effectively a morbid contraction in a long canal, of which the fibres are accustomed to a periodical distension certainly more than five times as great. At the same time, assent may readily be granted to the high value of the practice instituted by Dr. O'Beirne, the result being attributable, in many instances, to the recovery of tone in the fibres of the colon, lost by over distension and regained after the escape of a portion of the contents through a tube; and, in some others, to the removal of hardened or impacted feces forming a mechanical obstruction to the evacuations—the very position modestly taken by Dr. Duguid, and for which he is so severely castigated.

It would be doing great injustice to the author, if in this very imperfect sketch of the work we were to leave the reader under the impression that it contains little deserving of high praise, both as to originality and practical utility. There is every reason to believe that he is perfectly original in the practice of exhausting flatus from the colon by means of a flexible tube, and in the application of this instrument in a variety of diseases in which costiveness had never been previously considered the result of an obstacle to the evacuation of the sigmoid flexure of the colon. He has completely established his point in this respect; and the cases detailed, in which the symptoms of retrocedent gout, spinal irritation, narcotic poisoning, abdominal tumors, strangulated hernia, colic, enteritis, puerperal fever or rather a threatening of this disease, dysentery, tympanitis, and even delirium tremens, have been materially relieved by his mode of practice, are in the highest degree important.

The second part of the work, which is a close and most valuable commentary upon the evidence afforded by Sir Charles Bell's experiments upon the nerves of the face, should be studied by every student of the works of this physiologist.

If Dr. O'Beirne should experiment upon the nerves of the colon and rectum with the same skill and judgment which he displays in analyzing opinions on those of the face, there can be but little doubt that the cause of the science will be seriously advanced; but it is probable that his present opinions, as to the balance of power between the rectum and colon, would then undergo some modifications.

Waiting with some anxiety for the promised treatise on tetanus, we will now close by recommending this work to all cool pathological examiners, who cannot fail to find therein many valuable hints that we have been compelled to pass unnoticed.

One word to the author at parting—The tribute of praise that is justly his, would be rendered quite as willingly if somewhat less exactly demanded.

R. C.

Art. XIV. *On the Analysis of the Blood and Urine, in Health and Disease, with Directions for the Analysis of Urinary Calculi.* By G. O. Rees. pp. 147. London, 1836.

A Report on the Chemistry of the Blood, as illustrative of Pathology. By Egerton A. Jennings, F. L. S., Surgeon to the Leamington Charitable Bathing Institution. From the Transactions of the Provincial Medical and Surgical Association. Vol. III. London, 1835.

Morbid Conditions of the Blood. By B. G. Babington, M. D., F. R. S. In the Cyclopædia of Anatomy and Physiology. Parts IV. and V. London, December, 1835, and March, 1836.

We propose to present to our readers in this article, a summary of the contents of the three essays, the titles of which we have given above.

According to one of the analyses of Lecanu, 1000 parts of healthy blood consist of

Water,	780.145
Fibrin,	2.100
Colouring matter, (hematosin)	133.000
Albumen,	65.090
Fatty matter,—	
Crystalline,	2.430
Oily,	1.310
Extractive matter, soluble in alcohol and water,	1.790
Albumen combined with soda, (albuminate of soda)	1.265
Chloride of sodium, Chloride of potassium Carbonates, Phosphates, alkaline, Sulphates,	8.370
Carbonate of lime, Carbonate of magnesia, Phosphate of lime, Phosphate of magnesia, Phosphate of iron,	2.100
Loss,	2.400
	1000.000